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TECHNOLOGY DEPARTMENT

MARCH 4, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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MAR 1) 1950
DETROIT

The Return of the Sea Otter

See Page 140

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MEDICINE

WonderDrugCuresTyphus

Chloromycetin prevents as well as cures the dreaded jungle disease, scrub typhus. This wonder drug was tried due to the lack of a satisfactory vaccine for scrub typhus.

➤ CHLOROMYCETIN, one of the Big Four of today's wonder drugs, can prevent as well as cure the dangerous jungle disease, known as scrub typhus or tsutsugamushi disease.

Field experiments showing this were described by Dr. Joseph E. Smadel of the Army Medical Center in Washington, D.C. Dr. Smadel, who is leaving for Malaya on a third tropical medical expedition, spoke as guest of Watson Davis, director of Science Service, on the nation-wide Columbia network.

"The most satisfactory method for the prevention of disease is vaccination, because this protects the individual for relatively long periods," Dr. Smadel explained. "For this reason, the United States Army vaccinates against smallpox, typhoid fever, diphtheria, tetanus and many other diseases. Unfortunately, it is not always possible to develop a satisfactory vaccine against a disease. Then it becomes necessary to use other methods of prevention.

"Since no satisfactory vaccine has been developed for scrub typhus, it was hoped that chloromycetin might prove to be a chemoprophylactic agent as well as a curative agent. While other members of a research team in Malaya were treating patients, the entomologists of the group, Dr. Cornelius Philip of the U. S. Public Health Service and Major Robert Traub of the Army, went out into the brush to find areas suitable for these chemoprophylactic experiments. These areas must be heavily infested with the mites which transmit the disease. Two such areas were found nearby.

"Healthy volunteers were exposed in these areas. One-half of these volunteers were given chloromycetin during exposure. The other half served as controls and received no drug. No cases occurred in those receiving the drug while 70% of the control group developed scrub typhus. These men, who had not received prophylaxis, were promptly treated and cured. It appeared that chloromycetin not only would cure scrub typhus but would prevent its development in persons taking the drug during their exposure and for a short period following the last exposure."

The list of diseases which can now be successfully treated by chloromycetin includes, besides scrub typhus, epidemic typhus fever, typhoid fever, Rocky Mountain spotted fever, brucellosis or undulant fever, tularemia or rabbit fever, certain types of pneumonia and certain types of bladder and kidney infections.

Science News Letter, March 4, 1950

PSYCHIATRY

Spots Emotional Problems

➤ A NEW picture test for rapidly detecting emotional problems in eight- to 14-year-olds was announced by Dr. Max L. Hutt of the University of Michigan at the meeting in Atlantic City, N. J., of the American Orthopsychiatric Association.

With the new test, psychologists can tell in 75% less time than by present methods whether a child has an emotional problem and what it is. And methods for giving it have been so simplified that an objective analysis can be given by a trained clerk.

The test consists of 21 separate pictures of familiar situations. Four of them, called "core pictures," are used first. The child is asked to describe what he sees in these. The problem is located by observing the following factors in the child's response: 1. frequency of a particular verb tense, such as did, or does, or will do; 2. emphasis on certain pronouns, I or you or him, for example; 3. preference for popular or unpopular themes; 4. type of story ending; and 5. reference to special sexual characteristics.

With the problem determined, the remaining 17 pictures in the series are used to pick out the specific conflict troubling the child. The kind of problem bothering a child can be determined by the test even before he is capable of putting it into words.

Working with Dr. Hutt in development of the new test were Dr. Samuel W. Hartwell, Guen Andrew, research psychologist, and Ralph E. Walton, research coordinator, all of the Michigan State Department of Mental Health.

Science News Letter, March 4, 1950

VETERINARY MEDICINE

Find Quick New Test For Newcastle Disease

➤ NEWCASTLE disease of poultry can now be quickly and easily identified by a new and simple blood test that eliminates costly laboratory analysis.

The disease is caused by a virus, is highly contagious, and causes death and heavy egg production loss. Speedy and accurate discovery is important because the symptoms of Newcastle disease are easily confused with those of other diseases.

The simple blood sampling and analysis technique of the new test can be performed on the farm by the veterinarian, without the necessity of carrying blood samples to the laboratory. In two to five minutes, the veterinarian knows whether the birds are affected or not.

The technique, which is suitable for inspecting large flocks quickly, was developed by Drs. S. L. Zargar and B. S. Pomeroy at the University of Minnesota. Dr. Zargar, deputy director of veterinary sciences, Nagpur (India), reported his findings in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION (Nov.).

Science News Letter, March 4, 1950

WILDLIFE

Carp Make Ducks Carp, Birds Make Carp Duck

➤ IF you think civilization is complicated, you should be glad you're not a carp.

It seems that carp eat plants and ducks eat plants. Unfortunately the same plants. Carp, being fish, can get to the root of the matter. They not only destroy the aquatic plants whole, but they churn up the mud so that new plants can't grow.

The ducks go hungry and grumble audibly. Man who loves all of nature's creatures, especially duck, deer or trout, hearkens to the ducks' carping, and he obligingly poisons the carp which is not a game fish.

As if this wasn't hard enough on the carp, the cormorant enters the picture too. Cormorants are rather large goosenecked fish-eating birds. One of their favorite foods is—that's right, carp.

Fishermen used to think that they went after salmon and trout. They were so unhappy about this that at one time they were offering 25 cents for every cormorant head brought in. Now, however, it has been demonstrated that cormorants stay away from the swift game fish, preferring the slower moving fish. In the latter category are included great quantities of carp, says the Fish and Wildlife Service which has just gone into the matter in some detail.

Although the carp comes out worst, it looks as though everyone has grounds for complaint except the cormorants, which seem to be sitting pretty. But they have their troubles too. In China and Japan fishermen put a ring around the bird's neck so it can't swallow. Every time they catch a big fish, the fishermen take the fish away and send the birds back for more.

If you think civilization is bad, you should be glad you're not a cormorant, either.

Science News Letter, March 4, 1950

READY FOR DELIVERY

NUCLEAR PHYSICS-BIOLOGY

Radiation Produces Freaks

Mice with stomachs which burst from swallowed air are produced by irradiation of mothers. Abnormalities vary with the age of the embryo at irradiation.

➤ BABY mice whose stomachs blow up like balloons and burst from swallowed air, because their deformed mouths do not allow them to nurse normally, are among the abnormal types produced by irradiation of their mothers.

Such effects of radiation, whether from radioactive materials produced in the atomic pile or from X-rays, are being studied as part of the research program of the Biology Division of the Oak Ridge National Laboratory.

Comparison with the effect on human babies whose mothers received X-ray treatments during pregnancy is not possible as yet. Not enough is known about abnormalities which could be traced to such a source nor about comparative doses of radiation in humans and in mice.

Studies at the Oak Ridge National Laboratory suggest, however, that treatment with X-rays at any stage of pregnancy is attended by grave risks to the developing child. The Oak Ridge geneticists find that there is no threshold below which X-rays do not produce some effect. The only question is whether the effect is so slight as not to handicap the offspring, or so severe as to produce a monster incapable of developing into a normal human being.

Damage such as the piece broken off the gene by a passing neutron is being studied. Other damage under study is the cumulative effect on future generations from mating of apparently normal individuals carrying injury inherited from irradiated parents and grandparents.

Abnormalities of development occur when developing embryos are irradiated, and the type of abnormality is found in these studies to be determined by the prenatal age of the baby. An X-ray dose on the ninth day after conception may spoil the formation of the mouth so that only air is swallowed when the newborn mouse tries to nurse. The same dose on a different day may result in an entirely different kind of malformation, such as fusion of the elbow joint to make the forelegs stiff and useless. Milder types of abnormalities result in mice with forked tails, mice without hair, and even mice with defective skins.

Effects of irradiation of parent mice are followed through many generations of offspring in the studies, which are expected to furnish information never before gathered on the results of rays, whether from accidental exposure to radioactive sources or from medical treatment. Abnormalities which have been found so far are of the same type that occur among mice not known to have been irradiated. They seem to occur more frequently among the descendants of animals exposed to such rays.

Science News Letter, March 4, 1950

AGRICULTURE

Water for Crop Irrigation From Man-Made Snow Drifts

➤ ELEVEN-FOOT drift fences which mound up large catches of snow at high altitudes in the Western mountains may increase valley stream flow sufficiently to add nearly half a month to the irrigation season.

This extension, amounting to some 12 days, would come during the parched days of July when the extra irrigation would be most welcome.

The possibilities of high altitude "snow dams" are being explored by Foresters H. W. Lull and H. K. Orr of the U. S. Department of Agriculture, who are experimenting with drift fences on the catch basin of Ephraim Creek, high in the Wasatch Mountains of Utah.

They have been setting up drift fences of the familiar slatted kind used along highways. They find that a seven-foot fence is ineffective, but that 11-foot fences caught deep drifts which remain unmelted for as long as 12 days after undrifted snow has disappeared.

The drift fence experiment is designed to prolong the period of useful moisture in areas where it is uneconomical to build a reservoir for the purpose. Ordinarily snow melt provides irrigation water during the spring, with an over-abundant flow during May and June.

If the snow can be successfully held in the mountains for an additional period, the farmers of the arid valleys would benefit materially.

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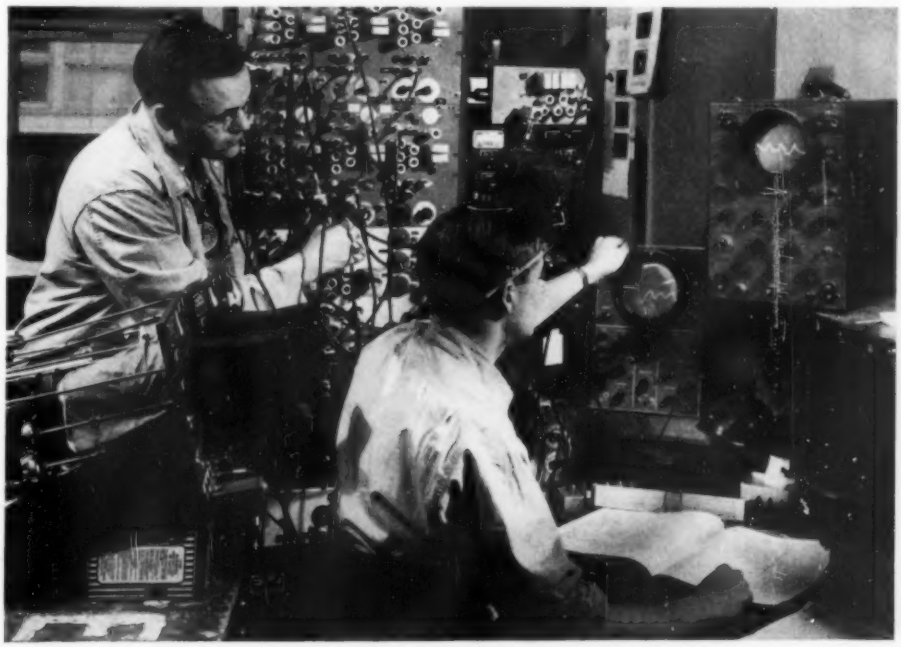
MATHEMATICS-ENGINEERING

Baby "Brain" Gives Quick Answers for Big "Brother"

➤ A BABY "brain" that quickly solves problems so that its big "brother" can do further work on them was announced in Cambridge, Mass.

This machine is an electronic differential analyzer. Although it solves problems quickly, it is not as accurate as the larger



THE ANSWER—The answer to a complicated differential equation solved on the new bantam electronic differential analyzer in the Research Laboratory of Electronics at Massachusetts Institute of Technology is read by Robert H. Cannon, Jr., instructor in mechanical engineering (right). Ragnvald Maartmann-Moe (left) operates the machine. The round screen in front of Mr. Cannon shows how a hypothetical speedboat would actually move through sea waves of the type portrayed on the screen at the right of the picture.

machines, Prof. Albert G. Hill of Massachusetts Institute of Technology's Research Laboratory of Electronics stated.

The machine uses radio circuits exclusively and presents its answers on an oscilloscope. An oscilloscope has a screen that looks rather like a television screen, except that the background usually resembles graph paper and the pictures are a series of wavy lines.

These lines are the answers to the problems that are fed into the machine. To keep the picture bright and clear, the machine repeats its solution to every problem 60 times per second. It continues to repeat this information until new instructions are given.

The bantam-sized brain occupies no more space than an ordinary office desk. Even though it is less accurate than the larger machines, it can be used to find preliminary solutions and to indicate the kind of answer to be expected. This saves a considerable amount of time and money, since the larger machines are expensive to operate.

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NUCLEAR PHYSICS

Simple Radiation Counter

➤ AN ACCURATE, pocket-sized radiation indicator, so simple that the man-in-the-street can interpret it after a few minutes instruction, has been developed at the University of California Atomic Energy Project, Los Angeles, Calif.

It measures radiation by a color change of chemical solutions in small vials. These chemicals are inexpensive and it is estimated that the device could be produced very cheaply.

The handy instrument was developed by Dr. George V. Taplin and Clayton Douglas of the U.C.L.A. Medical School's atomic energy medical research staff.

The small vials are contained in a plastic case about the size of a pack of paper matches which may be worn around the neck like "G.I. dog tags." They may also be adapted to a pencil-like container for pocket wear.

The new radiation indicator was specifically designed to measure large doses of gamma and X-rays. It lends itself to the development of important peacetime applications, Dr. Taplin says.

For example, it could be useful in calibration of radiation equipment, such as fluoroscopes and X-ray machines. In the treatment of hyperthyroidism by radio-iodine, the amount of radiation in the thyroid gland could be measured by wearing the device around the neck. It might also be adapted to a small capsule for use in measuring radiation received internally in treatment of abdominal tumors.

The principle of the device was developed from a fact long known to science. This fact is that chloroform, when irradiated, releases small amounts of acid. The amount of acid produced is directly related to the quantity of radiation received. In the small vials of the devices are chloroform and a purple dye which turns yellow in the presence of a certain amount of acid.

The chemicals in each vial are adjusted to react to a prescribed level of radiation. Thus the amount of radiation is immediately evident upon noting this color change in a particular vial.

Existing measuring devices are somewhat complex, Dr. Taplin points out. They require either electronic equipment or photographic facilities and special training to read and interpret them. Also they are highly susceptible to the effects of jarring and temperature changes.

Advantages of the new device lie in its simplicity and the fact that its chemicals ordinarily are not affected by these factors.

Further investigations are being carried out to evaluate the accuracy of the device and to study its stability under the most adverse field conditions.

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Photographs: Cover, U. S. Fish and Wildlife Service; p. 133, Piasecki Helicopter Corporation; p. 135, USAF Air Materiel Command; p. 138, 139, Harvard College Observatory; p. 144, Tennessee Eastman Corporation.

● RADIO

Saturday, March 11, 3:15-3:30 p. m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. R. G. Breckenridge of the United States Bureau of Standards will talk on "Electrical Compounds of the Future."

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NUCLEAR PHYSICS

H-Bomb Is Not End of Life

The most gigantic H-bomb would not explode the atmosphere or the waters of the ocean. There is less in the H-bomb than in the A-bomb to propagate a chain reaction.

➤ NOT even a monster super-H-bomb, the most gigantic that can be visualized, would explode the atmosphere of the earth or the waters of the oceans, ending life on the earth as we know it.

That is the best judgment of scientists, despite the alarming statements of a few physicists. The damage that a dozen or so H-bombs could do to big cities is quite alarming enough without calling upon a chain reaction in the atmosphere or the seas.

There is energy (excess mass that turns into energy) when hydrogen, oxygen and nitrogen of the air and water are transmuted to other elements. That is clear and no scientist disputes this fact. But in the explosion of an H-bomb there is even less than in an A-bomb of the sort of radiation and other debris that would propagate a chain reaction, particularly in the light elements.

In the H-bomb the process is more of a combination of the light-weight elements involved to make other elements with an incidental loss of mass or matter, which turns into energy. This is what is called fusion. In the uranium-plutonium atomic bomb it is a matter of these two very heavy elements splitting into other middle-weight elements, with a slight loss of mass that turns into energy. This is called fission.

In fission of the A-bomb, neutrons in excess are let loose and this makes possible the extremely rapid chain reaction. Probably neutrons do not have such a key role in the so-called hydrogen bomb, which seems to be a matter of smacking together the atoms of the hydrogen isotopes, deuterium and tritium (double and triple weight hydrogen), one or the other or both.

To set off a chain reaction in the atmosphere or in water, something to react with the oxygen and hydrogen of the water and the nitrogen and oxygen of air would have to be produced in profusion. This does not seem to be provided by the H-bomb if guesses as to its nature are correct.

Not only that, but if the triggers or inciting radiations were present, the atoms of the air and water are too far apart to be easily acted upon and transmuted in bulk as would be necessary for an "end-of-the-world" disaster. It is quite probable that one of the problems of the hydrogen bomb will be to get the hydrogen, normally a gas in free state, into such solid or compact state that it will be able to react in large quantity very quickly.

If there was believed to be any considerable risk to an atmospheric or oceanic chain explosion, it is very likely that even the Russians would think a long time before risking a test. We must assume that since they seem to want to have a communistic world, they will not risk anything that they believed would envelope the whole earth in flame.

Science News Letter, March 4, 1950

GENETICS

Who Has Marriage Choice Is Essay Subject

➤ A WOMAN'S choice of marrying material may be much more restricted than she thinks. The American Genetic Association suspects that this is true and, in an effort to make sure, is sponsoring a $2,000 essay contest.

The association expects the qualified applicants to write between 25,000 and 50,000 words on some of the factors which limit the choice of a mate and the effects of those limitations on heredity.

It has long been known that geography forces the men and women in some communities to keep marrying back and forth between the same few families. But very little work has been done on other factors which keep a group of people isolated in their marriage habits through generations.

In one community in North Carolina, for instance, 76% of all marriages were between members of the same church congregation. Other factors which limit a woman's choice of a man are physique, race, religion, family, social position, occupation and wealth.

When a group of people all follow the same general set of limitations in choosing mates and, consequently, intermarry within themselves for several generations, the geneticists call that group an "isolate." The geneticists have found that in both human and animal isolates, recessive hereditary defects tend to crop up more often. These defects may be tendencies toward deafness, diabetes, rheumatic fever, feebleminded-ness and even some forms of cancer.

Since no one knows how many human mating isolates there are in the United States, nor what size they are, the contest is being held to find out. Qualified students in the fields of genetics, sociology and statistics will be asked to make studies of such groups of people and report their findings in the contest essays.

Once the geneticists know more about isolates in this country, they can go ahead with studies of how recessive hereditary defects operate and, perhaps, come up with the answers to some of our hereditary diseases.

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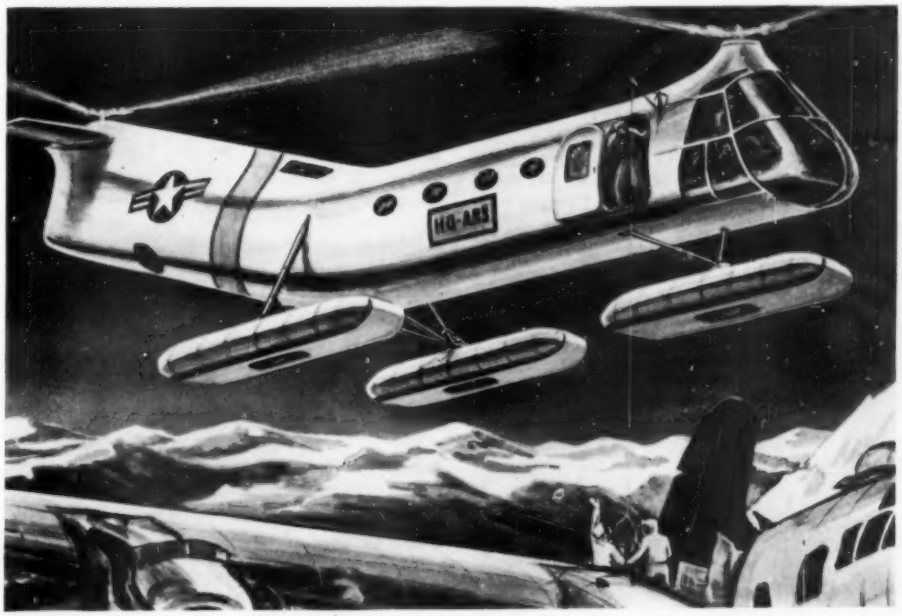


"OMNIPHIBIOUS HELICOPTER"—The world's first helicopter designed specifically for large scale rescue work in the Arctic will be able to land on snow, ice, water, tundra, marsh or land without changing gear. The 20-foot long cabin can accommodate up to 12 litters plus two seats for medical attendants, or 20 troop seats, or as many as 27 persons can be carried in the floor of the big cabin.

GENERAL SCIENCE

Projects of STS Winners

➤ WINNERS in the Ninth Annual Science Talent Search were required to write essays as part of the competition. Summaries of some of the essays appeared in Science News Letter, Feb. 25, 1950. Further summaries follow:

Rat Hypertension Relieved

High blood pressure can be relieved in rats just as it can in humans by a salt-free rice diet, Victor J. Rosen, Jr., 16-year-old Beverly Hills (Calif.) High School senior, has just demonstrated.

Patterning his experiment on ideas he got from reading technical literature on the subject, Mr. Rosen produced high blood pressure, or hypertension, by removing one kidney from each of six rats. After they had been six weeks on a standard rat diet, he divided them into two groups of three each.

One group got a salt-free rice diet and the other got rice with salt added. Autopsy showed that each of the salt-free rats had a normal heart and kidney while the other rats showed definite signs of hypertension.

This experiment is not the first scientific research Mr. Rosen has to his credit. With direction from medical men he has done dissections of several kinds to gain experience for his planned career as a surgeon.

Survey of Comic Readers

School kids from the fifth to eighth grades average better than a comic book a day, says 17-year-old Stanley Korenman, who has just completed a study of the reading habits of 774 grade schoolers who own a total of 28,500 comic books, or an average of 44 each.

Mr. Korenman, a senior at Brooklyn's Abraham Lincoln High School, came up with several other statistics in an independent survey.

He found that library book reading drops off much less slowly than comic book reading as the children get older—for the very good reason that it doesn't have as far to fall. While the children are reading an average of more than seven comics a week, even the library card-holders are averaging a bit less than four books a month.

Mr. Korenman, whose scientific interests range from mathematics and physics to biology and social science, hopes to go to Princeton in preparation for a career as a research physicist.

Measures Alpha Particles

A 16-year-old boy has devised an instrument which shows and measures alpha particles given off by radioactive atoms.

The teen-age physicist, Lawrence Rosler, is a senior at Brooklyn Technical High School. His apparatus shows visually the intensity, energy, and range of alpha particles emitted by such substances as uranium, radium, and thorium.

Unlike the well-known Geiger-Muller counters now widely used to detect outputs of atomic energy, the device is sensitive to alpha particles only. Other rays are counted along with alphas in a Geiger counter, but in Mr. Rosler's device they are screened out.

The youth, who aspires to be a research physicist, stands fifth among the 610 classmates with whom he will graduate this month.

New Fish Species Found

Stickleback, round scad, and mangrove snapper have now been added to the lists of fish found in New York waters, thanks to the investigations of a 16-year-old Brooklyn high school boy, who aspires to be a marine biologist.

Malcolm Gordon, New Utrecht (Brooklyn) High School senior, found the hitherto unrecorded fish in an independent survey he made during the summer at Coney Island. In all he hauled in 20,000 fish of 33 species. Along with the expected herrings, alewives, menhaddens, anchovies, and eels, he found the three new fish. The stickleback is of the kind known as the 10-spined stickleback. The New York Zoological Society, which keeps track of the local fish population, has added his discoveries to the list of fish known to frequent New York waters.

Mr. Gordon's study of shallow-water fish has been published in the American Museum of Natural History's publication, MARINE LIFE.

Lectures on Atomic Energy

If the residents of Bellingham, Wash., and vicinity have a better understanding of atomic energy than their fellow citizens elsewhere, they can thank an 18-year-old high school boy, William D. Gunter, Jr.

Mr. Gunter, who stands first in the senior class at Mt. Baker High School at near-by Deming, was the moving spirit behind a model demonstration of atomic energy which has been shown to many local community groups.

The demonstration, accompanied with lectures by fellow students and a question-answering period by Mr. Gunter, was assembled at the request of the Atomic Energy Commission. It consists of charts and models emphasizing the theory and applications of atomic fission.

Although the exhibit was made by many students, most of the credit is given to Mr. Gunter who co-edits the school paper and is active in a variety of extra-curricular activities from the Rifle Club to basketball and softball. He plans a future career in chemistry.

Studies Plant Galls

Donald McCormick, 17-year-old Oak Ridge (Tenn.) High School senior, has been preparing himself for a career in biochemistry by devoting his leisure hours to a study of plant galls, those abnormal plant growths which bear a close resemblance to human cancer.

Concentrating his investigations on galls appearing on goldenrod, Mr. McCormick found that the two main causes of stem gall are a gall fly and a gall moth which wound and infect the goldenrod stem. Altogether there are some 150 kinds of goldenrod galls. He did not find all of them in his collecting around Oak Ridge.

One of Mr. McCormick's findings was negative. Knowing that oak galls yield as much as 50% to 70% of commercially valuable tannin (used in tanning leather), he tested goldenrod galls for tannin content and found it too low to be profitable.

Builds Geiger Counter

From spare-time tinkering to a career as a research physicist is a long, hard road, but 18-year-old Ronald Fuchs of John Muir (Altadena, Calif.) High School has just taken the first step on this desired path.

Mr. Fuchs who hopes to enter California Institute of Technology to study physics and electronics, built a Geiger counter of his own design. Subsequent experiments with it led him to a study of the conductance characteristics of gases.

Prior to this the young scientist designed and built several other radio appliances, including a short wave receiver, a sound amplifier, and an instrument for analyzing sound distortion. He ranks fourth in the June graduating class of 445, and finds time to tutor fellow students in algebra.

Isolates New Bacteria

Three apparently new kinds of bacteria have been isolated by a 17-year-old high school boy. Edward Wawszkiewicz, of North Smithfield, R. I., discoverer of the tiny organisms, has built two bacteriological incubators for his home laboratory and worked long hours learning the best method of staining bacteria. Three unidentified species appeared in his cultures.

If he is correct, and they turn out to be new species, there is ample precedent for naming them after the youth. In the study he carefully described the three microorganisms.

The Mt. St. Charles Academy (Woonsocket, R. I.) senior, plans a career in bacteriology.

GENERAL SCIENCE

Background of Winners

The family background of the winners in the Science Talent Search varies in occupation of parents, size of families, economic status and nationality of parents.

➤ AMERICA'S scientists of the future are coming from a variety of family backgrounds. No certain set pattern of family living produces boys and girls talented in science, if a study of the home life of 40 of the most promising young scientists this year is an index.

These 40 high school seniors arrived in Washington, D. C., March 2 for the Institute of the Ninth Annual Science Talent Search, conducted by Science Clubs of America, administered by Science Service. Chosen for their potentialities as future research scientists, they will compete for $11,000 in Westinghouse Science Scholarships to be awarded March 6.

The winners enjoy stable home life. All except six are fortunate in having both parents still living.

Exactly half of these 15- to 18-year-old high school seniors have parents who were both born in this country, but that the U.S.A. is still a melting pot is indicated by the parentage of the other 20. Nine have one parent born outside the U.S.A. They include four from Russia, two each from Canada and Poland and one from Austria. The other 11 have parents who were both born outside this country: 11 are from Russia, four from England, two from Switzerland and one each from Canada, Czechoslovakia, Germany, Lithuania and Poland.

Economic status aand occupation of the father seem to have very little to do with the making of a scientist. The fathers of the 40 winners are about evenly divided in professional and non-professional occupations. Among them are three teachers and a school principal; four managers: a theater, a sand and gravel concern, a shoe store and an office; three salesmen; two college professors; two lawyers; two farmers; a mechanical, an electrical and an aircraft engineer. One each is a railroad man, mill worker, architectural draftsman, cab driver, dress presser, decorator, internal revenue agent, sign painter, chemist, boiler maker, real estate operator, milliner and laundry route man.

Mothers of the winners are in general occupied with their duties as homemaker but 10 find time for full or part-time jobs in addition. Among them are two teachers and a school clerk, a seamstress, newspaper publisher, rent consultant, secretary, factory hand and a business woman.

Approximately 57% of the winners' fathers and 35% of their mothers attended college.

Twenty of the winners admit they have no known relatives who are scientists. Relatives of the others include scientists or science teachers of varying age and importance. Among them is a predominance of medical men and engineers.

Examples of scientific relatives include:

Miss Alice J. Warren of Ithaca, N.Y., has a father and a grandfather who have each served Cornell University as professor of agricultural economics.

Saul Sternberg of Brooklyn, N.Y., is the nephew of Dr. Mildred Cohn who, as a physical biochemist, has worked with three Nobel prize winners: Dr. Harold Urey at Chicago University and now with the Drs. Cori at Washington University in St. Louis, Mo.

The father of Donald B. McCormick of Oak Ridge, Tenn., is a chemist who holds patents in ceramic chemistry.

Miss Cynthia Wyeth of Philadelphia, Pa., comes from a long line of scientists, some of whom established the pharmaceutical house: John Wyeth and Bro. Her father is an electrical engineer; her uncle a cold weather expert with the USAAF and an amateur ornithologist.

Edward Wawszkiewicz of Woonsocket, R.I., is the cousin of a former professor of mathematics at the University of Warsaw who "was put in a concentration camp and used as a guinea pig by the Nazis."

Size of the family does not seem to have anything to do with guaranteeing ability as a scientist—or in stifling it. Twelve of the 40 are only children. Nine have one brother and five have only one sister. Of the other 14: six are one of three children; one has three siblings; four are one of five children and three are one of six children.

Two of those from a family of six are Patricia and Cynthia Jackson of Forest Hills, N.Y., who are themselves two of a set of triplets. Their sister triplet is not interested in science as a career and did not enter the Science Talent Search competition. Of those with brothers and/or sisters nine are the oldest of the children while 11 are the youngest children in the family.

Science News Letter, March 4, 1950

ENGINEERING

Material Selection for Atomic Plant Has Problems

➤ IT IS "internal corrosion" from high-energy radiation that creates the hard-to-solve problems which engineers designing the furnace of an atomic power plant have to solve. Ordinary rusting and other corrosion problems present no special difficulties.

Some of these problems were summarized by Harry E. Stevens, of General Electric, a staff member of the Knolls Atomic Power Laboratory which G-E operates for the Atomic Energy Commission.

From a nuclear reactor, which is the furnace of an atomic power plant, there are emitted high-energy particles and radiation, he stated, comparable with those that would be discharged from several tons of pure radium.

These are able to penetrate considerable thicknesses of any material, he said. They may change the arrangement of the atoms of which a structure is made, and materially alter its physical properties.

Thus a structural material that may be entirely satisfactory for ordinary engineering uses might be unfit for prolonged operation in an atomic power plant.

There may be an adverse effect in another way, he continued. The atomic particles, called neutrons, which are produced in large numbers in the reactor, are responsible for maintaining the chain reaction by which atomic energy is released. Control rods, which soak up these neutrons as a blotter soaks up water, are required to keep the reactor from running away.

However, if very much else of the structure acts as a neutron blotter, the supply of neutrons will be depleted, and the power reduced.

Such considerations, Mr. Stevens declared, "drive us to consider strange new structural materials, and these in turn raise a whole new array of procurement problems."

Science News Letter, March 4, 1950

THE ARCTIC LOOK—The newest item in Arctic flying gear is this seat-style survival kit which doubles as a cushion in flight. The kit contains 22 different items, including a vacuum packed sleeping bag.

NUCLEAR PHYSICS

AEC Working on Tritium, Possible H-bomb Material

➤ NEW evidence that Los Alamos Scientific Laboratory, the Atomic Energy Commission atomic bomb installation in New Mexico, is working on tritium, possible fundamental material of the hydrogen bomb, is contained in a scientific publication just issued in New York.

"Some Calculated Properties of Tritium" is the title of a communication from E. F. Hammel which appears in the JOURNAL OF CHEMICAL PHYSICS (Feb.). This technical report compares the constants, including vapor pressure, of the three isotopes of hydrogen: ordinary hydrogen, heavy hydrogen called deuterium which is twice as heavy, and the triple weight variety which is tritium.

That tritium can be obtained as a solid at very low temperatures is made clear in the article.

Tritium is rumored to be the form of hydrogen used in the H-bomb and it is manufactured in the uranium reactor by bombarding the metal lithium. Very small quantities are understood to be available even for research.

Science News Letter, March 4, 1950

MEDICINE

Typhus and Flu Epidemic in Japan

➤ TYPHUS fever and influenza are both epidemic in Japan, according to telegraphic reports received at the World Health Organization's regional office in Washington, D. C.

Although WHO states there is no cause for alarm, 150 confirmed or suspected cases of typhus have been reported in Tokyo during the period Jan. 15 to Feb. 15, and the number is growing weekly. Yokohama reported 26 cases during a recent week. All passengers disembarking at that port were required to present vaccination certificates.

The influenza epidemic, starting on Shikoku island last December, has now spread throughout the country. For the week ending Feb. 4, latest on which reports have been received, there were 2,125 cases. Only Kyushu in the south and the northern part of Honshu were free of the disease. The disease is mild and is due to Type B virus.

Science News Letter, March 4, 1950

CHEMISTRY

New Process Removes Phosphorus from Sewage

➤ THE removal of phosphorus from sewage discharge to prevent contamination of lakes and streams, and to recover the valuable fertilizer material, is promised by scientists at the University of Wisconsin, Madison, Wis.

"We have developed a pilot plant which looks like it can take the phosphorus out of sewage effluent," Prof. William L. Lea and Prof. Gerard A. Rohlich, declared. The method has not yet been tried on a large scale, but it appears to be both effective and cheap. It is offered as the answer to a problem for which a solution has been sought for years.

The method is a "flocculation process" which involves the addition of about 200 parts-per-million of alum to a batch of sewage effluent. This mixing brings about the formation of a sludge which sinks to the bottom of the tank, carrying the phosphorus and alum with it.

This alum-phosphorus sludge is removed and treated with sodium hydroxide which brings the alum and the phosphorus into solution. The solution is removed and treated with another cheap chemical, calcium chloride. The phosphorus is drawn off as calcium phosphate, which is ideal for fertilizer. The alum is recovered in a form which permits re-use.

Surplus phosphorus in lakes and streams is one of the elements held responsible for nuisance growths of algae, these scientists state. Atomic-research men would no longer have to worry about danger from radioactive phosphorus in wastes where the process is used, they say. The new method is the result of experimental work carried on by them under the sponsorship, in part, of the National Institute of Health.

Science News Letter, March 4, 1950

NUTRITION

Vitamin A in Biblical Diet of Locusts and Honey

➤ THE Biblical feast of locusts and wild honey owed some of its nourishing value to a vitamin in the locusts, it appears from research on the biochemistry of these insects.

"A handful of locusts would go far toward providing the daily requirement of vitamin A," the editor of NUTRITION REVIEWS (March), scientific journal published in New York, estimates.

His estimate is based on the amount of vitamin A's parent chemical, beta-carotene, found in a single adult African migratory locust. Carrots and other yellow vegetables are a more familiar food source of this pre-vitamin chemical. But, he points out,

"Properly prepared locusts are considered a delicacy in parts of Africa and elsewhere."

The amount of beta-carotene in locusts was reported by Drs. T. W. Goodwin and S. Srisukh in the British scientific publication, BIOCHEMICAL JOURNAL.

Finding vulnerable points in the insect's chemical processes in the hope of getting better methods of stopping the pests is the main object of such biochemical research. Discovery of their nutritional value is a side result.

Science News Letter, March 4, 1950

IN SCIENCE

ENGINEERING

Tank Settlings Yield Valuable Oil and Wax

➤ THE settlings or waste materials in the bottom of petroleum storage tanks and in earthen pits yield valuable oil and wax in a process developed by the U. S. Bureau of Mines.

In a pilot plant at El Dorado, Kans., where the process is under test, 600 barrels of clean oil have been salvaged from 2,000 barrels of pit waste emulsion containing water and dirt among other things.

The recovered oil contained 15% to 18% of microcrystalline wax, a type of wax that will stand more heat without melting than regular paraffin wax. It is used in coating food containers, and is particularly valuable in packaging products sent to the tropics.

The method worked out at the pilot plant should be applicable in general principles to virtually all oil-field emulsion, Bureau officials state. Applications of the process may enable the petroleum industry to recover thousands of barrels of useful products, and also help solve the problem of the disposal of waste materials.

A description of the process in detail is given in a Bureau bulletin that may be obtained from the Superintendent of Public Documents, U. S. Government Printing Office, Washington, D. C., for 25 cents. Its title is "A Method of Resolving Oil-Field-Waste Emulsions."

Science News Letter, March 4, 1950

MINING

Large Deposits of Coking Coal Found in Maryland

➤ NEW discoveries of large deposits of semi-smokeless coal in Western Maryland have been revealed by the U. S. Department of the Interior. The estimated reserve is more than 600,000,000 tons.

The new deposits are found in 10 beds buried below the two that have provided in the past most of the coal of the Georges Creek field in Allegany and Garrett counties. Those two have been worked for many years and are facing depletion.

The department's Bureau of Mines and the Geological Survey, with Maryland agencies cooperating, are responsible for the new discoveries. The coals found rank as low-volatile bituminous, and carbonization tests showed that they yielded strong coke. Some of the coal found is in beds too thin for economical mining, but two-thirds of it is in beds from two to over three feet thick.

Science News Letter, March 4, 1950

NCE FIELDS

ASTRONOMY

Experts Disagree on What Makes Stars Twinkle

➤ BRITISH scientists are engaging in a controversy over what makes a star appear to twinkle. Three letters in the British scientific journal, NATURE (Jan. 28), take issue with a theory expressed recently that the twinkle of a star is really a twinkle in your eye.

These letters say that variations in the brightness of stars are caused by hot and cold air currents in our atmosphere.

British ophthalmologists H. Hartridge and R. Weale started the controversy by reporting that their experiments showed minute movements in the eye gave rise to the twinkling effect. Neither bright nor very dim lights seem to twinkle, they said, but lights of in-between strength would hit a few of the little rods and cones which receive light impressions in the eye. As the eye moves ever so slightly, the light hits first one cone and then the other, thus making it appear to twinkle.

In the NATURE article, three astronomers take issue with the two eye men. One of them, C. C. L. Gregory of the University of London Observatory, points out that star twinkling diminishes when the atmosphere is calm and gets worse when hot and cold air currents are acting up.

An American ophthalmologist, who refused to allow his name to be used, said that both sides in the British star-twinkle controversy were probably right. "Either the optical effects of the air currents or what happens to a light image inside the eye, or both of them together, might cause a star to appear to twinkle," he said. "And I'm rather sure that neither side will ever prove its case."

Science News Letter, March 4, 1950

PHYSICS

New Color Filter Uses Three Films of Fluoride

➤ A NEW color filter, said to be the simplest means yet devised for producing color of a high degree of purity, has been revealed by Bausch and Lomb Optical Company. Possible applications will include color photography and color television.

When ordinary white light passes through the filter, one of its component pure colors emerges. These colors are red, blue, green and yellow. This new filter has three thin films of silver and magnesium fluoride applied to one side of the glass by a high-vacuum process.

As described by Dr. Arthur F. Turner, of the company, silver is introduced into an evaporator on a heated metal strip. Under vacuum, the silver particles fly off and bombard the glass. A coating of magnesium fluoride is applied in the same manner, then another film of silver. A cover glass is cemented on to protect the films.

"The thickness of the magnesium fluoride film determines which color will pass through the filter," Dr. Turner stated. "If a uniform coating is applied, a uniform color will appear over the entire surface of the filter. If the fluoride coating is applied thinner at the center and thicker toward the edges, different colors will appear as concentric rings."

Science News Letter, March 4, 1950

AGRICULTURE

Weed-Killer Speeds Fruit, May Give Peaches in April

➤ A WEED-KILLING chemical that also has the ability to hasten fruit to maturity may pave the way for peaches in April and apples in August.

Although all talk of using the chemical, the synthetic plant hormone 2,4,5-T, in commercial orchards is still highly speculative at this time, recent experiments have given promising results.

When 2,4,5-T, chemically 2,4,5-trichlorophenoxyacetic acid, is applied to apple trees, the fruit matures sometimes as much as 30 days earlier than usual. This 30-day extreme was achieved with Rome Beauty apples, but since this is a fall variety, it is not as significant as less spectacular results with summer apples.

In experiments conducted at the Department of Agriculture's experiment station at Beltsville, Md., treatment with 2,4,5-T caused the summer types to mature from 5 to 13 days early. Any fruit grower who could get his apples to market that much sooner would have a competitive edge over growers whose apples matured naturally.

Experiments with peaches have shown similar hastening of the fruit, but the eating quality of the peaches is not all it could be.

Although the Department has been experimenting with plant hormones for 20 years, the present work is only two years old, and there are still many unknowns. The three scientists on the project, Dr. Paul C. Marth (hormones), Dr. C. P. Harley (apples), and Dr. A. Leon Havis (peaches), can not explain just why the hormones have this quick maturing effect.

One effect 2,4,5-T has when sprayed on fruit trees, aside from speeding up maturation, is to kill some of the leaves. The scientists are still not sure what effect this will have on further experiments or on possible commercial applications.

Science News Letter, March 4, 1950

INVENTION

Burning Coal Underground Heats Water for Power

➤ A NEW wrinkle in burning coal underground in its natural layers, to obtain gases for combustion or for use in making liquid fuels, is added in a process for which a Swedish inventor received an American patent.

In his process he utilizes the underground fire to heat water to use for power or other purposes. A few extra holes are drilled down into the layer of coal to be burned and circulatory pipes are put in the holes through which water is forced.

The inventor is David Dalin of Sodertalje, Sweden. He was awarded patent 2,497,868.

His method of obtaining combustible gases from the underground coal is similar to processes already in experimental use in various parts of the world. The American experiment is at Gorgas, Ala., conducted as a joint project of the U. S. Bureau of Mines and the Alabama Power Company.

Holes are drilled from the surface down through a layer of coal. A fire from an ignition bomb is started at the bottom of one. Air under pressure is forced down the hole to assist the burning. The same air pressure forces the gases of combustion into the other holes, at the tops of which they are collected.

Science News Letter, March 4, 1950

ZOOLOGY

Oregon Crab Walks 90 Miles

➤ AT least one Oregon crab would qualify for membership in any hiking club, having walked 90 miles. Tagged off the Alsea, this crab was captured off Cape Blanco—90 miles away—five months later. This and other examples of similar long "walks" by crabs have been discovered by aquatic biologists of the shellfish laboratory of the Oregon State Fish Commission.

This is the second year of a study to determine whether crabs along the Oregon coast are one population or a series of small populations. This research has now shifted to Newport where biologists are tagging 1,000 crabs. Already this season 1,600 crabs have been tagged in the Coos bay area and 1,000 in the Columbia river. The scientists also hope to find the degree of travel by crabs between bays and the ocean.

The crabs are marked with celluloid tags about the size of a dime, fixed to the right corner of the shell. The research men go out with commercial fishermen, buy crabs that they wish to mark which have been caught in the gear, and then release the shellfish to the ocean bottom.

Science News Letter, March 4, 1950

ASTRONOMY

Sun Catapults Gas Here

Hydrogen is being flung toward the earth by solar magnetic fields. Clouds of gas striking the earth probably cause the aurora borealis.

By WADSWORTH LIKELY

➤ MASSES of hydrogen and other gases are being catapulted at the earth by the sun's magnetic fields. Dr. Donald Menzel, associate director for solar research of the Harvard College Observatory, has reached this conclusion after studying movies of the sun's corona.

Brilliant displays of northern lights, or the aurora borealis, he says, are probably caused by clouds of gas striking the earth after having been shot away from the sun.

Energy Creation

However, this hydrogen that reaches the earth is similar to that used in the vast process of energy creation which is going on continuously in the sun. That energy which the sun creates out of hydrogen, the sun sends us so that we may live.

Dr. Menzel and other astrophysicists are studying the sun to learn more about this life-giving process. From a mountain peak in Colorado, Harvard scientists have taken movies which have resulted in a new theory about the sun's prominences, flares and corona and a new explanation of the relationship of these solar phenomena to the earth.

The sun creates energy, as Dr. Hans Bethe, famed physicist of Cornell, has explained, when, deep in the sun's interior, carbon atoms capture hydrogen atoms, digest them by atomic processes, spit out an atom of helium and a lot of energy and in the same instant return to carbon to begin the process all over again.

Great Clouds of Gas

Dr. Menzel's motion pictures show great clouds of shining gas—mostly hydrogen—raining down on the sun from enormous heights above the surface. Two things about this solar rain struck Dr. Menzel. First, the volume of gas going down to the surface of the sun did not seem to be equaled by the visible amount going up. Second, the "rain" didn't fall fast enough.

Occasionally, says Dr. Menzel, there are upward streams of material, great surges of gas that rise perhaps a quarter of a million miles, sometimes as high as a million miles. Some of these surges look like supergiant geysers, whose width is greater than that of the earth. But most of this material seems to cascade immediately back upon the solar surface and does not appear to cause what Dr. Menzel calls rain.

Since the scientists atop their Colorado mountain could not see the upward-rising mass of hydrogen which had to be present to provide a source for the rain, they concluded that, when it rose, it was not luminous and, therefore, invisible. Recently a colleague of Dr. Menzel's, Dr. Walter Roberts, discovered an activity on the sun's surface which he called "polar spicules."

These objects are bubbling, spurting jets, which shoot out a core of luminous hydrogen gas that dims out while it is still rising. These jets are found near the sun's poles.

Dr. Menzel says that the gas from these spicules, while it is falling, goes to make up the sun's corona—that halo we see during a total solar eclipse. As the hydrogen comes down, he says it becomes intensely hot, four times hotter than even the normal shining surface of the sun. As it becomes hot, it once more becomes luminous, and therefore visible.

As the gas becomes hotter, it is falling toward the sun's surface. But it is not falling fast enough. Something is competing with the sun's gravitational pull. Dr. Menzel thinks that both the heating and the slowing down are caused by the sun's magnetic field.

The magnetic field, he says, has associated with it invisible lines of force, which extend out into space all around the sun in a fairly regular pattern. As the clouds of hydrogen fall, they become entangled in this mesh of lines, which might be termed a mighty roof of magnetic girders over the sun.

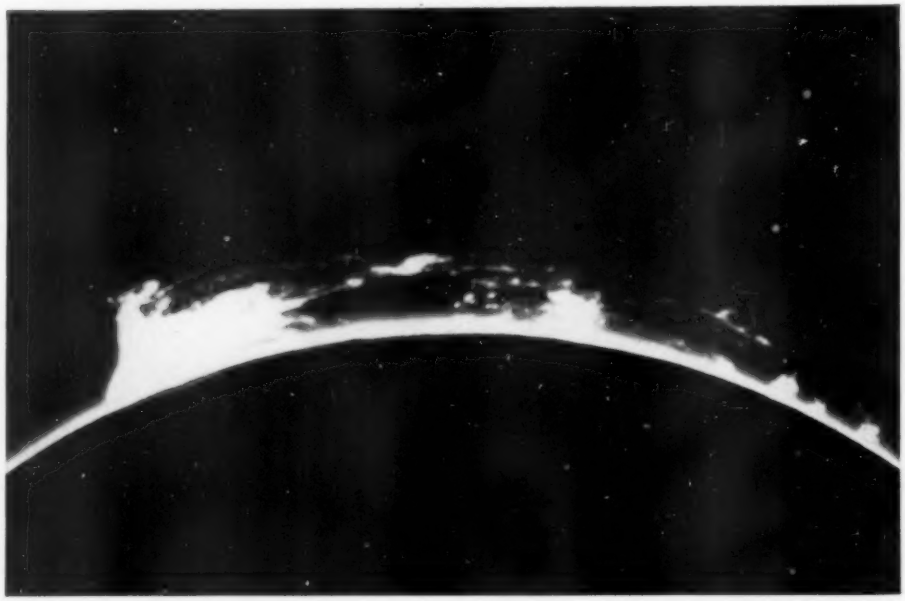
Lines Support Gas

This mesh of lines tends to support the gas, unless too much gas accumulates. Then the lines, which are partially elastic, tend to sag and form a pocket. Of course, more and more gas tumbles into the pocket, until the mesh collapses and the gas falls to the sun's surface.

The sag in the mesh lies on the sun's surface until some of the gas leaks away, like snow melting. When the amount of gas diminishes far enough, the normal elasticity of the mesh of lines of force reasserts itself, and the gas is flung back out into space, as from a giant slingshot.

It is then that some of the gas is sent toward the earth.

Dr. Menzel uses an instrument known as a coronagraph to make his observations



"ACTION ON THE SUN"—Stills from movies showing the prominences of the sun are part of about 15,000 feet of motion pictures of the sun which went into a film called "Action on the Sun" taken since 1943 at the High Altitude Observatory of Harvard University and the University of Colorado, Climax, Colo. The movies show great clouds of luminous gas, mostly hydrogen, raining down on the sun, sometimes from heights as great as a quarter of a million miles.

SUN GAZING—Two miles up, in Climax, Colo., scientists study the sun from the observatory. Using a rare coronagraph, they have taken movies which throw new light on the activities above the sun's surface and the relation of those activities to the earth.

of the sun. There are only two of these in the western hemisphere now, one two miles up at Climax, Colorado, and the other on Sacramento Peak in New Mexico.

Harvard and the University of Colorado operate the Climax station jointly, under the sponsorship of the Navy and the National Bureau of Standards. They go two miles up in the mountains because the skies are so clear and blue there.

The coronagraph is a telescope with a very perfect lens, made from the finest glass which is kept completely free of dust. Because Dr. Menzel and his associates want to study the corona around the sun, they put a small disk in the telescope which just eclipses the sun—artificially.

Science News Letter, March 4, 1950

MEDICINE

Blood Plasma for Arthritis

➤ BLOOD plasma from women who have just given birth to babies may be added to the new medical weapons against arthritis.

"Striking clinical improvement" lasting from three to 16 weeks after such treatment in rheumatoid arthritis patients is reported by Dr. Louis W. Granirer of the arthritis clinic at Queens General Hospital, Jamaica, N. Y.

"Improved sense of well-being, a brighter mental outlook, increased appetite, a disappearance of joint symptoms, a gain in weight" are among the results of the treatment reported by Dr. Granirer in the journal, SCIENCE (Feb. 24).

There were no toxic effects and in 320 such plasma transfusions no case of jaundice.

The material is readily available and comparatively inexpensive, Dr. Granirer points out.

The pattern of albumin and globulin and total proteins in the blood plasma of the mothers just after childbirth, he found, seems to be like the pattern for these chemicals in the blood plasma of expectant mothers at or near term. This may explain why the post-childbirth blood plasma is effective in rheumatoid arthritis. Pregnancy has previously been known to produce a partial or complete let-up of symptoms in rheumatoid arthritis in a high percentage of cases.

The effect of the post-childbirth plasma, Dr. Granirer thinks, is not solely due to a "steroidal factor," such as ACTH or cortisone, the two anti-arthritis hormone chemicals.

Science News Letter, March 4, 1950

NUCLEAR PHYSICS

Scientists Look for Increase in Cosmic Rays

➤ SCIENTISTS have sent balloons high into the air trying to catch increased cosmic ray activity on photographic plates.

They were looking for a sharp increase in this ray activity because of the sudden increased activity of the giant sun spot area that recently traveled across the sun.

They are trying to find out if there is a correlation between the solar noise outbursts and cosmic ray activity, in order to get a better idea of the origin of cosmic rays.

There are, however, only five known instances of cosmic ray photographs being taken at the time of or directly after a solar flare. Scientists, therefore, need more instances of this type before they can establish any correlation between solar flares and increased cosmic ray activity.

Science News Letter, March 4, 1950

Good-Bye Old Hearing Aid

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PSYCHOLOGY

Personality-Prejudice Link

➤ THE person who understands himself shows less race prejudice than the person who cannot face his own motives. This was discovered through personality tests and a questionnaire of eight sociology classes at Washington Square College in New York.

"Self-accepting personality" is the name psychologists have for the person who accepts his good and bad feelings, works out his own problems, and, as shown by the test results, shows less race prejudice.

The person who cannot face his own motives and conflicts has a "self-rejecting" personality. And racial hatred serves as a "safety valve" for the repressed hostilities and desires of the self-rejecting personality.

The finds based on the tests of 169 Jewish college students are reported by Dr. Jerome Himelhoch in SOCIOLOGICAL REVIEW.

A liberal college atmosphere affects racial attitudes. While parental feelings strongly dominate a person's attitudes, a liberal college atmosphere tends to make self-accepting personalities more tolerant.

The liberal atmosphere, however, has less effect on students of a self-rejecting personality since they tend to cling to family ideology. But their apparent loyalty to family is only a farce because actually this attitude helps them to forget their true feelings of resentment toward their family.

The persons who showed prejudice toward one racial group were more likely to feel prejudice toward all racial groups. The students who were tested tended to show less racial prejudice toward their own racial group than toward other racial groups.

It was found that a mild race hatred and a violent race hatred have similar characteristics. Dr. Douglas M. Kelley, one of the psychiatrists at the Nuremberg trials, made available records of the Rorschach, or ink blot tests made of war criminals such as Von Ribbentrop, Rosenberg, Streicher, Ley, Goering, Frank and Doenitz. The ink blot test results suggest that mild and violent race prejudice differ only in degree, not in quality as once thought, although more research is needed in this field.

The findings of these studies will help toward planning educational programs for combating race prejudice and developing more tolerant attitudes. For greatest efficiency these programs must take into account personality differences.

Science News Letter, March 4, 1950

WILDLIFE

Mountain Goats Take Harrowing Journey

➤ A HARROWING hill-and-dale odyssey took place in Montana when the U. S. Fish and Wildlife Service cooperated with the Montana Fish and Game Department in a wildlife restocking program. The object was to transfer game to suitable areas so that sportsmen can get a crack at it.

The plan was to move 19 mountain goats from one part of Montana to another.

First they were caught in a trap, trussed up, and blindfolded. Then their stiletto-sharp horns were cemented into the two ends of a short length of garden hose, so that they looked like push bars on baby carriages.

They were then bundled onto a rubber boat which gathered speed, shot the rapids, and plummetted down the mountain like a toboggan. This was the first half of the trip.

On the second leg they were trundled aboard a Stinson plane and flown to the foot of another mountain. Here pack horses took over. The goats were strapped onto the horses and bounced up hill to the new range area.

Six mountain goats died of fright or from unseasonable heat enroute.

In the past nine years 96 mountain goats have been live-trapped in Montana for this purpose. This is apart from the 100 or so that are killed by hunters. In 1947 the official legal bag in Montana was 128. In Idaho the same year the hunting toll was 67.

Mountain goats are large animals, averaging around 200 pounds. They are not really goats at all, being members of the antelope family.

Science News Letter, March 4, 1950

WILDLIFE

See Large Fur Income In Sea Otters' Increase

See Front Cover

➤ ONE of the most prized and luxurious furs in the world, the pelt of the sea otter, may be available again in limited quantities, if present Government plans materialize.

For the good word, just released by the Fish and Wildlife Service, is that the Aleutian otters, as shown on the cover of this week's SCIENCE NEWS LETTER, are on the increase. Once all but exterminated from their Bering Sea habitat first by Russian and then by American indiscriminate slaughter, the sea otters after 40 years of protection number more than 8,000 animals. Sea otter fur is dark or reddish brown, sometimes almost black. The hairs are long and fine, velvety to the touch and lustrous. A small quantity of pelts, mostly from animals which died natural deaths, are certified and sold on the commercial market each year.

The Government refuge workers plan to establish new sea otter colonies among the islands and along the coast of Alaska. If the transplants are successful, and the colonies grow, it is expected that a small cull can be made each year of local excesses. It is estimated that this harvest might reach a yearly value of several hundred thousand dollars.

Science News Letter, March 4, 1950

AGRICULTURE

Pears Unfit for Canning Due to Poor Graft-Union

➤ THOSE undersized unsalable fruits which appear in Canadian and American Kieffer pear orchards may be the result of a poor graft-union. Kieffer pears are widely grown for canning.

For years pear growers have noticed that certain of their trees turned prematurely to autumn colors and that these same trees produced small fruits unsuitable for canning.

A study of the problem has been made by G. S. Randhawa of India, W. H. Upshall of Canada, and H. B. Tukey of Michigan. Their findings, reported in SCIENTIFIC AGRICULTURE (Oct., 1949) indicate that the small fruits and the coloring are caused by nutritional difficulties brought about by a poor graft-union. Apparently, the incompatible graft prevents the proper flow, or translocation, of nutrient materials within the tree.

Among other suspected causes of poor translocation are mouse injury to the roots and an overly wet soil.

Science News Letter, March 4, 1950

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POPULATION

300 Million Population?

➤ WE might have a population up to 300,000,000 by the year 2000 and most population experts are wrong in figuring that this country will ever reach a peak point of population. This is the opinion of Dr. Joseph S. Davis, economist and sociologist, who is head of the Food Research Institute at Stanford University, Calif.

Our population in 2000 is likely to be under 200,000,000 and if we don't reach a peak in population in the next 50 years, we will soon thereafter, according to Dr. Philip Hauser, director of the government's Bureau of the Census. Terming Dr. Davis' idea on population trends, "utter nonsense," Dr. Hauser said that he had a high respect for Dr. Davis' opinions in his own fields of economy and sociology.

Dr. Davis expressed his ideas on population in a pamphlet entitled "The Population Upsurge in the United States" published recently by Stanford's Food Research Institute. He based his reasoning on the large increase in the birth rate during the 1940's, a factor which he says was not foreseen by population statisticians.

He warned business, private investors, farmers and the government that they should reconsider their long-range planning to take into account what he predicts will be a much expanded population.

However, Dr. Hauser says that the increased birth rate of the 40's was merely a cyclical fluctuation and that the long-range trend, supported by studies and statistics of 150 years, is sufficient backing for the belief that the increase in population in the next 50 years will not double and that either during that period or shortly thereafter, our population will level off. "I will lay odds on this and cash in on it," said Dr. Hauser.

Dr. Davis also disputes the population experts on size of the aged group in our population. Said he, "Forecasts for the percentage of the population constituted by the upper age groups have been rendered wholly untrustworthy by the unforeseen flood of births in the 1940's and the rate of improvement in life expectancy at ages below 60 . . . The rapidity of the prospective aging of the population as a whole has been exaggerated."

Dr. Hauser considers that the increase in the percentage of the aged will still continue to rise much faster than Dr. Davis expects. He once more points to long term trends and also to the advances in medicine which are beginning to tackle the diseases of the aged.

Science News Letter, March 4, 1950

MEDICINE

Films Help Mentally Ill

➤ MOVING picture films can be used to help mentally sick patients back to health, Dr. Miguel Prados of Montreal, Can., declared at the meeting of the American Orthopsychiatric Association, Atlantic City, N.J.

The films he has been using are carefully selected to suit the particular patients he is treating. They are not the ones you see when you go to your neighborhood theater. And after seeing the picture, the group of patients has a discussion session with the psychiatrist.

"Hostility" and "Rejection" are the titles of the two films he has used. They were made by the Canadian Film Board for mental health education of parents, teachers, social workers and others working with children. Their use in treatment of patients is new.

"I can see myself as Margaret in so many things," one patient said referring to a character in "Rejection."

"Her life history was not exactly like mine, but many things that happened in the movie hit home with tremendous force," this patient continued during the group discussion.

"That was just like my mother. That was just the way I responded, but I think it should have been handled differently," said another patient.

These comments from the patients show that seeing the film helps the patients release feelings they cannot formulate by themselves when talking to the doctor. In this way, with the material brought up by the film for discussion, the pictures help toward the patient's recovery.

Science News Letter, March 4, 1950

AERONAUTICS-NUCLEAR PHYSICS

Bombers Powered by Atomic Energy Might Circle World

➤ SUPERSONIC bombers might make non-stop trips around the earth if powered by atomic energy, the National Conference on Industrial Hydraulics was told in Chicago by Andrew Kalitinsky. He is working at Oak Ridge Laboratories, Tenn., under sponsorship of the Fairchild Engine and Airplane Corporation on atomic power for planes.

Atomic energy as a source of power for aircraft promises airplanes combining extremely high speed with almost unlimited range, he said. Atomic power offers fuels such as uranium that would not be consumed nearly so fast as those in chemically fueled planes.

Developing a nuclear aircraft power plant will be difficult, he asserted. But there are several basic types of power plants that can be adapted to utilize this power. All are thermal power plants, since fission energy is released predominantly in the form of heat. He cited turbo-props, turbo-jets, ram-jets and rockets as examples.

Science News Letter, March 4, 1950

Words in Science—TRAPEZIUM-TRAPEZOID

➤ TRAPEZIUM is defined, as it was first by Euclid, as a four-sided plane figure, no two sides of which are parallel. Trapezium is pronounced tra-pe-zi-um, with the accent on the second syllable, giving it a long "e."

A trapezoid, pronounced trap-e-zoid with the accent on the first syllable and a short "e," is also a four-sided figure. It is, however, one in which two of the sides are parallel.

Science News Letter, March 4, 1950

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by

ALBERT EINSTEIN

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BOTANY

NATURE RAMBLINGS

Hepatica

➤ IF you look sharp as you make your way about the woods you may see the hepatica in flower. It is the earliest of the common woodland plants.

The flowers are white, pink or bluish. They stand in fresh contrast to the tough winter-purpled leaves of the previous season's growth.

The striking feature of this earliest of spring harbingers is the characteristically shaped leaves. Long ago it was noticed that the three-lobed leaves are suggestive of small livers. Hence the name "hepatica," which means liver-like.

Hepatica is an evergreen that is found frequently in association with pines, spruces, and cedars. It is usually found in shady spots standing in a rich well-drained loamy soil. It has a thickish hairy stem and the foliage lasts from one season to the next.

The liver-shaped leaves do not wither and die. Instead they seem to weather the cold in much the same way a boy's lips do when he swims in the creek too long: that is, they take on a purplish cast. It is usually easy for this reason to distinguish between this spring's leaves and last summer's. The newer leaves are not only smaller, they are also greener.

Following the ancient doctrine that any plant or plant part that looked like an animal or animal organ was supposed to be good for the ailments of that organ, medical men of bygone days used to make pungent brews and potions of the little hepatica plant which were used to treat liver ailments.

Because of its early springtime appearance, some gardeners favor using it in borders, or in a rockery where it thrives on the north or east slope. It is very easy to propagate by dividing the roots. This method is favored over seed propagation, because with seed you have to wait until next season for flowering.

Science News Letter, March 4, 1950

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NUCLEAR PHYSICS

Chemical Crystals Help Detect Nuclear Radiation

➤ A NEW kind of radiation detector for use in locating nuclear radiation, revealed by Dr. R. M. Lichtenstein of General Electric, in Schenectady, N. Y., utilizes chemical crystals which become conductors of electricity when exposed to certain wavelengths.

The crystals used by him are potassium bromide. Normally they are non-conductors of electricity. In his work, the crystals were exposed to gamma or X-rays and illuminated by a special light. Electric charge then flowed through them when a voltage was applied through suitable electrodes. The amount of charge transmitted is a measure of the radiation dosage to which the crystals were originally exposed.

This method of detecting nuclear radiation is based upon a discovery made more than a half century ago relative to the crystal-changing characteristic. It promises to have wide application particularly in medical work and other places where isotopes from the atomic pile are employed.

Science News Letter, March 4, 1950

MEDICINE

Movie May Help Save Lives of Cancer Victims

➤ A MOTION picture which may help save between 16,000 and 25,000 lives of breast cancer victims each year in the United States had its premiere in Washington, D. C.

The film, produced under the auspices of the U. S. National Cancer Institute and the American Cancer Society, is for doctors, and shows physicans how to recognize breast cancer in its earliest stages.

A companion film, to show women themselves the basic facts about breast cancer and a simple method of periodic self-inspection of the breasts, is being produced by these same organizations.

Nearly 50,000 women develop breast cancer each year and more than half of them die of it within five years. Current mortality figures show about 16,000 deaths from this cause in one year, and cancer statisticians find the cancer death rate increasing, so there might be as many as 25,000 breast cancer deaths in a single year.

A brighter side of this picture, showing the life-saving value of early diagnosis, was presented by Dr. Austin V. Deibert of the National Cancer Institute at the cancer film preview.

He cited new figures from a cancer survey in Atlanta, Ga. This is one of 10 cities which were first studied 10 years ago and in which repeat surveys were just completed.

If the cancer at the time of diagnosis is at an early, localized stage, the probability of survival is 93%, Dr. Deibert reported. If there is regional involvement or beginning spread of the cancer, the probability of at least one year survival, though still favorable, drops to 88%. But if diagnosis is delayed until the cancer has spread to remote parts of the body or all over, the probability of survival drops sharply. One-half the patients will die within a year.

In Atlanta almost one-third, 30%, of the cases were actually diagnosed at an early, localized stage. But slightly more, 31%, were advanced cases with spread to remote parts of the body at the time of diagnosis.

The cancer film was given its premiere at the meeting of the American Medical Association in Washington, D. C.

Science News Letter, March 4, 1950

INVENTION

Flame-Thrower Clears Roadside of Weeds

➤ ROADSIDE shoulders and roadside ditches will be completely cleared of vegetation down close to the earth, so that surface irregularities will be visible to the automobile driver, by use of a new weed-burner, or flame-thrower, on which a patent has been issued. Its efficiency is partly due to the use of a liquefied gas as a fuel.

The patent, 2,485,391, was awarded to Arthur S. and Etienne J. Lasseigne of Reserve, La. In addition to the type of fuel used, such as liquefied propane gas, this flame-thrower is so mounted on a frame that its nozzle can be adjusted to various positions desired.

The blast flame, created by the fuel and the special burners in which it is used, is projected with enough force so that it will penetrate thick and matted vegetation and effectively consume moist green growth. Other roadside flame weed-killers use oil for a fuel and their flame is apt merely to sear off the vegetation without clearing it to the surface of the earth, leaving ruts and gulleys concealed.

The entire equipment, including its fuel tank, is mounted on a sulky that can be attached to a truck or tractor. Its burner is on an elongated frame, pivotally attached to the sulky.

Science News Letter, March 4, 1950

Books of the Week

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ATOMS AT WORK: Part I—Power from the Atom Lee DuBridge; Part II—Atomic Energy Benefits — radioisotopes — Paul C. Aebersold — *Council on Atomic Implications*, 48 p., illus., paper, $1.00. An explanation for the layman.

EDGE OF THE JUNGLE—William Beebe—*Duell*, rev. ed., 248 p., $3.00. A new edition of the author's study of the animal life in British Guiana, originally published in 1921.

FERTILITY AND STERILITY, Vol. I, No. 1—Pendleton Tompkins, Ed.—*Paul B. Hoeber*, bimonthly, $8.00 per year in U.S., $9.50 Foreign, single copies $1.50. The official journal of the American Society for the Study of Sterility, devoted to the clinical aspects of infertility.

FROGS AND TOADS—Herbert S. Zim—*Morrow*, approx. 60 p., illus., $2.00. Sixth in a series of science picture books. Skillful illustrations for every page of text which greatly increase the value of the book.

FUNDAMENTALS OF DETERGENCY—William W. Niven, Jr.—*Reinhold*, 256 p., illus., $5.50. Intended to bridge the gap between the general and specialized information on detergency.

FUSIBLE ALLOYS CONTAINING TIN—*Tin Research Institute*, 24 p., illus., paper, free upon request to publisher, 492 West Sixth Avenue, Columbus 1, Ohio. A booklet discussing the composition, properties and uses of some of these alloys.

GEOLOGY AND GROUND-WATER RESOURCES OF NORTON COUNTY AND NORTHWESTERN PHILLIPS COUNTY, KANSAS—John C. Frye and A. R. Leonard—*University of Kansas*, 144 p., illus., paper, 25 cents. Results of data collected by the authors during the past four years.

GRAPHICAL METHODS AS APPLIED TO EXTRACTION PROBLEMS—Fred W. Bull and Guido J. Coli—*Virginia Polytechnic Institute*, 62 p., illus., paper, 50 cents. An introduction to the basic principles of extraction problems.

INFECTION AND SEPSIS IN INDUSTRIAL WOUNDS OF THE HAND: A Bacteriological Study of Aetiology and Prophylaxis—R. E. O. Williams and A. A. Miles—*His Majesty's Stationery Office* (U. S. Distributors: British Information Services, New York, N.Y.), Special Report Series No. 266, approx. 10 p., paper, 40 cents. A technical report.

AN INTRODUCTION TO THE ENGINEERING PROFESSION: Concerning Engineering Orientation and Engineering Problems—John G. McGuire and Howard W. Barlow—*Addison-Wesley*, 207 p., illus., $3.50. A problem text for introductory engineering courses.

JACOB STEINER'S GEOMETRICAL CONSTRUCTIONS WITH A RULER: Given a Fixed Circle with Its Center—Raymond Clare Archibald, Ed.—*Scripta Mathematica*, 88 p., illus., $2.00. First English edition of Steiner's work done in the mid-nineteenth century. Translated from the German by Marion Elizabeth Stark.

MAKING THE GRADE AS DAD—Walter and Edith Neisser—*Public Affairs Committee*, Pamphlet No. 157, 32 p., illus., paper, 20 cents. Answers many questions of fathers.

MAKING INVENTIONS PAY: A Practical Guide to Selling, Protecting, Manufacturing, and Marketing Your Inventions—Joseph C. Keeley—*Whittlesey*, 246 p., $2.95. Many practical suggestions on how to make your invention pay.

THE MEANING OF RELATIVITY: Including The Generalized Theory of Gravitation—Albert Einstein—*Princeton University Press*, 3rd ed., 150 p., illus., $2.50. A new edition of Einstein's classic presentation of the theory of relativity. The author has added a new appendix on the "generalized theory of gravitation" which attempts to interrelate all known physical phenomena.

OUTLINE OF RADIO, TELEVISION AND RADAR: A Symposium—*Chemical Publishing Co.*, 688 p., illus., $12.00. Fundamental principles upon which radio, television and radar depend, as well as the apparatus used and the various applications, are explained by a group of specialists.

PATENT PRACTICE AND MANAGEMENT: For Inventors and Executives—Robert Calvert—*Scarsdale*, 371 p., $5.00. Presents the essentials of the patent law and also some of its unusual features.

THE SCIENCE OF FLIGHT—O. G. Sutton—*Penguin Books* (U. S. Distributors: Allen Lane), 208 p., illus., paper, 35 cents. A non-technical account of aerodynamics.

SCIENCE AND THE GOALS OF MAN: A Study in Semantic Orientation—Anatol Rapoport—*Harper*, 262 p., $3.50. Discusses the age-old question "Is Science merely a tool, or can it be a way of life?"

SEWING MADE EASY—Mary Lynch—*Nelson Doubleday*, 400 p., illus., $3.95. A guide for both the beginner and the expert. There are 1000 step-by-step pictures.

SOCIETY AND ITS CRIMINALS—Paul Reiwald—*International Universities Press*, 315 p., $4.50. A study of the asocial person and his relationship to society.

WARTIME ECONOMIC PLANNING IN AGRICULTURE: A Study in the Allocation of Resources—Bela Gold—*Columbia University Press*, 594 p., illus., $6.75. A study of the factors responsible for short-comings in agricultural mobilization during the recent war.

Science News Letter, March 4, 1950

ENGINEERING

Super-Overdrive Gives More Miles Per Gallon

➤ MORE automobile mileage per gallon of gasoline is possible with transmissions to permit drive shaft speed to approach more closely engine speed, a University of Illinois engineer declared in Urbana-Champaign, Ill.

The statement was made by Prof. W. L. Hull on the basis of studies made by him. The type of transmission suggested is a super-overdrive. The transmission in an automobile cuts high engine speed to a lower speed in the drive shaft and consequently gives the car lower speed.

Present transmissions vary the relation between engine speed and drive shaft speed from 12 to one in low gear and from about four to one in overdrive. Prof. Hull visions level running ratios of 1.25 to one.

Present lower-priced automobiles have engines capable of delivering 80 horsepower at 60 miles an hour, he said. But on level running only 31 horsepower are actually used for travel. A suitable super-overdrive transmission would let the engine run at lower speed, therefore more efficiently and using less gasoline.

The technical explanation of why lower engine speeds provide more mileage lies in friction, he added. An 80-horsepower engine, running at 60 miles an hour, may use only 31 horsepower to move the automobile, yet devote another 30 horsepower to overcoming the engine's own internal friction. If the engine could move the auto at the same speed while itself running slower, then its own friction might consume only five horsepower.

Science News Letter, March 4, 1950

Coconut milk contains a still-unidentified substance that seems to stimulate growth in certain plant tissues.

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Science News Letter, March 4, 1950

❁ *PRACTICE DEVICE for drummers, recently patented, simulates the effect of a drum on the drum sticks but gives off very little noise. It is a box-like affair with a central thin percussion part in the top. It has control doors on the sides to give different sound effects.*

Science News Letter, March 4, 1950

❁ *STIFFER PAPER MATCHES are promised by an impregnation process on which a government patent has just been issued. These easier-to-light matches, which may be even narrower than present types, are treated with white paraffin, limed rosin, opal wax and carnauba wax.*

Science News Letter, March 4, 1950

❁ *FLATWARE CONTAINER, large enough to hold 100 pieces of kitchen flatware with a center place for spoons, forks and spreaders, is a plastic box-like device that will fit usual kitchen cabinet and dinette table drawers. Rounded corners make it easy to clean.*

Science News Letter, March 4, 1950

❁ *KNITTER'S AID, shown in the picture, is a plastic bracelet from which dangles a six-inch shaft on which a ball of wool can be impaled to keep it off the floor. The bracelet is adjustable to fit the wrist, and the yarn feeds freely and evenly from the ball.*

Science News Letter, March 4, 1950

❁ *GOLFERS' TEE, usable on ice or frozen ground, is a four-legged plastic device, one of whose legs projects upward while the tee rests on the other three. The end of each leg is cupped to hold a ball, and the legs are of different lengths to get desired tee heights.*

Science News Letter, March 4, 1950

❁ *MOLYBDENUM LUBRICANT, for high-speed, high-temperature and high-pressure bearings, can be used alone, or added directly to crank-case or other oils which carry it to the friction surface. Molybdenum is a "greasy" metal, practically indestructible at high temperatures and pressures.*

Science News Letter, March 4, 1950

❁ *VENTILATED IRONING BOARD, recently patented, will keep moisture from its pad and covering. The board is a flat hollow metal affair with a space between its upper and lower surfaces. Air is forced by fan into the space, and escapes through tiny holes in the upper plate.*

Science News Letter, March 4, 1950

❁ *LIQUID COOLING apparatus, to dispense carbonated and other beverages at a constant temperature and with taste unimpaired, has two compartments, one from which the liquid is withdrawn and the other for cooling. Liquid from the cooling compartment flows to the other in response to the temperature in the withdrawal chamber.*

Science News Letter, March 4, 1950

Do You Know?

The *protein* value of eight medium-sized eggs is equal to a pound of meat.

Shivering in the cold is natural; it is a step taken by the body to acquire warmth through exercise.

The reflecting power of *aluminum*, useful in reflecting heat, is particularly effective in ultraviolet radiations.

Casein bristle fiber in automobile air filters will provide an outlet for at least 1,000,000 pounds of casein annually, dairy experts estimate.

Lactose, a sugar found only in milk, has the same chemical formula as sucrose but is not nearly as sweet and it can not be fermented by yeast.

Sal ammoniac is chemically ammonium chloride; it is a common chemical with wide uses ranging from electric dry cells to calico printing.

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